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Subject: Bark Beetle Input for Blue Ridge Urban Interface Effects Analysis

To: Ed Paul,
Team Leader

Three alternatives have been developed for the Blue Ridge Urban Interface analysis (BRUI). This letter compares the effects of implementing these alternatives on bark beetle susceptibility and risk. The Blue Ridge Urban Interface analysis area encompasses a little over 31,000 acres around the Blue Ridge Ranger Station. Vegetation consists of predominantly ponderosa pine with an understory of grasses with juniper, pinyon pine and Gambel oak intermixed. Stocking is estimated to vary from 10 to 150 square feet for the ponderosa pine. No stand data is available for this analysis.

The two most common bark beetles affecting ponderosa pine along the Mogollon Rim in Arizona are the pine engraver beetles, *Ips* species, and the western pine beetle, *Dendroctonus brevicomis*. The pine engravers have been the predominant beetle causing tree mortality in the Long Valley, Blue Ridge area in the last 10 years. Pine engraver beetles prefer to breed in fresh pine debris such as that created during logging or construction operations or by weather events such as heavy snow, ice or wind storms; however living trees can be attacked, sometimes in great numbers in certain situations. A number of factors are associated with outbreaks of pine engraver beetles in living trees, including drought, presence of pathogens such as dwarf mistletoe, wildfires, dense stand conditions, etc. Pine engraver beetles typically attack smaller diameter trees or tops of larger trees. Western pine beetle outbreaks are favored by many of the same factors, except that this insect does not breed in pine debris and it prefers larger diameter trees. In general for both insects stand densities greater than 120 square feet are thought to be most susceptible.

Effects of Alternatives:

Alternative 1. Alternative 1 is the no action alternative. Under this alternative there would be no change in vegetative condition from the existing. Stands would continue to grow and increase in average diameter and in density. Effects on bark beetles would be as follows. Susceptibility to western pine beetle would remain unchanged and slowly increase over time. Areas with the greatest likelihood of infestation would be those with densities greater than 120 square feet and average diameters greater than 12 inches. Susceptibility to *Ips* would continue to increase with activity most likely to happen in the event of a drought or a snow or ice event that creates fresh pine debris.

Alternative 2. Alternative 2 would precommercially thin selected areas adjacent to private land. Ponderosa pine trees up to 9 inches in diameter would be thinned to a minimum 15 foot spacing and Gambel oak up to 5 inches would be thinned to a 5 foot minimum spacing. Slash within two chains of private property would be removed or chipped where practical or lopped to within 1 foot of the ground. Slash located further from private land would be lopped to within two feet of the ground. Under this alternative susceptibility to western pine beetle would be reduced in those



areas where densities are reduced to less than 120 square feet of basal area, preferably well below 120 square feet in order to allow for growth prior to the next entry. In areas with ponderosa pine trees with average diameters 10 inches or greater this would mean going to a wider spacing than 15 feet. For example for areas with an average diameter of 12 inches one would need to go to a spacing of 18 feet or greater in order to reduce densities to below 120 square feet. While long term susceptibility to bark beetles would be reduced in those areas treated as described above, risk of an Ips outbreak in living trees would increase temporarily during treatment when fresh pine slash is available for colonization. Risk would be highest in years when precipitation is 75 percent or less of average. Chipping or removal of slash, if done promptly, would mitigate this risk. Lopping to one foot would also help, though it would be best to lop and scatter slash in openings. Other tactics to reduce risk of an outbreak in standing trees include, crushing or burning slash promptly after creation, scheduling thinning between July and December (minimize creation between January and June), and monitoring green slash following creation so that if an serious infestation develops it can be treated.

Alternative 3. Alternative 3 would precommercially thin ponderosa pine both adjacent to and away from private land. Prescriptions for areas adjacent to private land would be the same as those described for alternative 2. For areas located away from private land, two prescriptions would be used, a general prescription and one for wildlife emphasis areas. In the general prescription pines up to 9 inches in diameter would be thinned to a minimum spacing of 15 feet. Slash would be lopped to 2 feet. No thinning would occur from June 1 to July 15. For the wildlife emphasis areas, pines up to 6 inches in diameter would be thinned to a minimum spacing of 15 feet. One untreated clump of up to 66 feet in diameter would be left per acre. Wildlife travel corridors would be deferred. Slash would be lopped to 2 feet and as in the general prescription, no thinning would occur between June 1 and July 15. For those areas treated adjacent to private land, effects of this alternative on bark beetles would be the same as described for alternative 2. Mitigation options would also be the same. This alternative would reduce long term susceptibility to bark beetles to a much greater extent than with alternative 1 or alternative 2, presuming more stands are treated to densities below the threshold of attack. As with alternative 2, risk of an Ips outbreak would increase temporarily during treatment, particularly in dry years. Mitigation options would be the same as described in alternative 2.

If you have any questions or concerns about this letter please feel free to contact me at (520) 556-2074 or jwilson/r3,coconino.

/s/ Jill L. Wilson, acting for:

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